Methadone Maintenance Treatment Five Years Later—Where Are They Now?

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Changes in social productivity and anti-social behavior in a cohort of 1,230 patients admitted to the Methadone Maintenance Treatment Program in New York through 1968 are presented. Data on 770 patients in treatment on December 31, 1973 are analysed separately, as well as follow-up status of 393 patients who discontinued treatment.

Historical Background

Methadone (hydrochloride) is a synthetic opiate which was developed in Germany during World War II as a substitute for morphine. Methadone has been used in the United States, primarily, as the drug of choice for the prevention of withdrawal symptoms for heroin addicts in the process of detoxification. In the detoxification process, methadone is initially administered in doses of 20-40 mg once or twice daily, with a gradually decreasing dose schedule over a period of several weeks to a dosage of zero. This has been a well-accepted use of methadone. Unfortunately, methadone detoxification of heroin addicts has seldom led to permanent abstinence; and it has been largely ineffective in helping the addict in his social rehabilitation. Methadone detoxification has been useful to addicts as a means of reducing the size of the dose and the cost of the habit for a short time. As an illustration, in 1965 the Morris Bernstein Institute (then Manhattan General Hospital) housed the largest Detoxification Unit in New York City. This institution reported 9,000 admissions that year. On closer examination, these admissions referred to approximately 3,000 heroin addicts who had presented themselves for detoxification an average of three times during that year. This was the "state of the art" in 1965.

In 1964 Drs. Vincent Dole and Marie Nyswander, working at Rockefeller University, recognized two properties of methadone: (1) methadone, unlike heroin, is effective when administered orally, and (2) its effects are of considerably longer duration. Using these two attributes, Drs. Dole and Nyswander conceived the notion that methadone, given orally in gradually *increasing* doses once a day over a period of several weeks, might produce a "blockade" against substantial amounts of heroin. This blockade with methadone might change the life style of the addict, releasing him from the need to hunt for a "fix" every four to six hours, and might thereby provide an opportunity for the patient to become involved in his own social rehabilitation. [1, 2] Following an experiment with six volunteers over a period of approximately one year under very carefully controlled circumstances, the results, using stabilizing doses of 80-120 mg of methadone a day, were so promising that Drs. Dole and Nyswander asked Dr. Ray Trussell, then Commissioner of Hospitals in New York City, to allot six beds to expand this "experiment." These beds were made available at the Morris Bernstein Institute. Included in the contract for this "experimental" program, was the provision for the establishment of an Evaluation Unit at The Columbia University School of Public Health, completely independent of any treatment unit. This "experiment" has since expanded substantially. As of December 31, 1973, there were approximately 40,000 patients in Methadone Maintenance Treatment Programs in the Greater New York Area. This report covers an evaluation of the first 1,230 patients admitted to Methadone Maintenance Treatment between January 1, 1964 and December 31, 1968. Over 90 percent of these patients were from either Beth Israel or Harlem Hospital; the remainder were from Bronx State.

Criteria for Admission

All of the patients were volunteers. Approximately one-half of them were required to wait for a period of three to six months after they were accepted before they could be admitted to a treatment unit,[3] due to a long waiting list of applicants.

Initial criteria for admission to the treatment program:

- A resident of one of the five boroughs of New York;
- At least 20 years of age;
- Without overt evidence of psychopathology;

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- At least five years of addiction to heroin;
- Previous record of arrests/incarceration;
- Evidence of previous treatment failures including detoxification;
- Acceptance of 5-6 weeks in-hospital induction phase;
- Signed consent to accept daily doses of methadone for an unspecified period of time.

The above criteria apply to 960 patients in this cohort.

In 1967 two of these criteria were relaxed to allow inclusion of patients who were 18 years of age with a minimum of two years of known heroin addiction. At the same time, selected patients were stabilized on an ambulatory basis, eliminating the expensive in-hospital phase. Two hundred seventy patients were admitted under these criteria. No patients under the age of 20 at the time of admission are included in this analysis.

Description of Cohort

In this cohort of 1,230 patients admitted to Methadone Maintenance Treatment between 1964 and 1968, 85 percent were men, 15 percent were women; 40 percent were white, 40 percent black, and 20 percent were of Spanish extraction. The average age was 33.7 years with a range of 20 to 83 years. The mean age of the black patients was slightly older (by 1.5 years) than either the white or Spanish patients.[4] These demographic characteristics are shown in Figure 1 and Table 1.

TABLE 1—Description of Cohort, 1964-1968

		Sex		Ethnic Group		
Age (years)	Total	Men	Women	Black	White	Spanish
0-29	371(40)	317	54(30)	125(23)	170(38)	76(30)
30-39	582(47)	493	89(49)	268(50)	192(43)	122(49)
40+	277(23)	239	38(21)	138(27)	87(19)	52(21)
Total	1,230(100)	1,049	181(100)	531(100)	449(100)	250(100)

( ) = Percentage

The average number of years of recorded addiction was eight years; all patients had records of previous criminal activity; the average number of arrests per patient was 3.5 in the three years prior to admission; and, approximately one-half of the arrests resulted in jail terms averaging six months. Because of this demographic picture, these patients have been characterized as "hard-core" or "criminal addicts."

The goals of the Methadone Maintenance Treatment Program have focused on social rehabilitation of the patient with major emphasis on assisting the patients, once they have been stabilized on methadone, to become employable. For the majority of the patients, this involves either completing their formal education, or learning a vocational skill, or both.[3,4]

Criteria for Measuring Success of Treatment

The criteria established by the Methadone Maintenance Evaluation Unit for measuring success of treatment relate to the goals of the program,[4] which include:

Methadone Maintenance Treatment Program

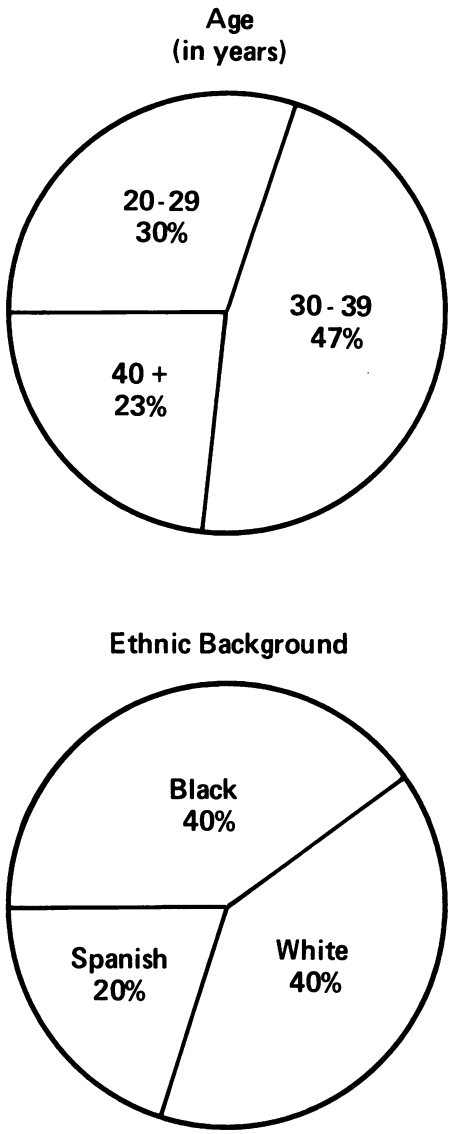

FIGURE 1—Characteristics of First 1,230 Patients Age 20 or Older Admitted to Methadone Maintenance Treatment Program 1964-1968.

- Increase in social productivity as measured by employment, schooling, or vocational training;
- Decrease in antisocial behavior as measured by reported arrest and/or incarcerations (jail), as compared with previous experience;
- Recognition of, and willingness to accept help for excessive use of alcohol, other drugs, or for psychiatric problems.

In order for these criteria to be meaningful, patients must remain under observation. Therefore, the retention rate becomes important. Among the patients in this cohort of 1,230 individuals, 770 or 63 percent were under observation on December 31, 1973; 640 (52 percent) had been in continuous treatment, the remaining 11 percent had left the program for varying periods of time but had returned and contin-

ued in treatment to the end of the study period. For the patients in continuous treatment, the period of observation ranged from 60 to 119 months with an average of six years and six months. For the 130 patients with interrupted treatment, the period under observation ranges from 17 to 106 months with an average of four years and four and one-half months. The discharge rate for each year of observation among those in treatment at the start of the year is shown in Figure 2. These rates are 11 percent in the first year, 8 percent in the second and third years, 6 percent in the fourth and fifth years, and 4 percent in the sixth year. During the study period, 460 patients (37 percent) left the program as shown in Table 2. Three hundred ninety-three or 32 percent left the program alive, and have not returned to any Methadone Maintenance Treatment program under our surveillance in the Greater New York Area, while 67 (5 percent) died while in methadone maintenance treatment.

TABLE 2—Methadone Maintenance Treatment Status as of December 31, 1973

Treatment Status	Number		Percent	
In Treatment Dec. 1973		770		63
Continuous	640		52	
Intermittent	130		11	
Discharged		460		37
Alive	393		32	
Dead	67		5	
Total	1,230	1,230	100%	100%

Sources of Data

The intake interview forms were the initial source of data. Data on previous criminal behavior, previous records of treatment, and welfare status for the three years prior to admission were validated through reports to the New York City Narcotics Register, from Police Department records and from records of the Welfare Department.[4]

The Unit Director's monthly reports were the initial source of the follow-up data, including employment status, schooling or training, criminal problems, and involvement with self-administered drugs of abuse. Urine analysis reports were not analyzed separately, but were an integral part of the monthly report, when applicable. Validation of the data was obtained by a "spot-check" on a 10 percent sample by interviews with the patients and the counsellors, and by requests for paycheck stubs when employment status was questioned. Reports from the Police Department to the Narcotics Register on arrests and incarcerations were also included.

Because of the availability of assistance in the program for legal employment, as well as for drug abuse problems, the patients' reports had a high degree of accuracy (82 percent).

The data were analyzed using a Life Table method to account for the variation in the periods of observation. The *N* for each year of observation includes all the patients from the cohort who were in treatment at the *start* of the interval.

Results

Social Productivity

Each of the patients was classified with reference to work status at time of admission, using a six-point scale.[5] Because of the crude nature of the data obtained for purposes of this analysis, the scale was reduced to a four-point scale including:

- Employed full or part-time;
- In school or training program;
- Homemaker (women only);
- Unemployed, including welfare or supported by illicit activities.

The entire cohort of 1,230 patients was followed at three to six months intervals throughout the study period and has been classified again according to work status at the end of the study period using the same classification scale. The study period covers the period from February 1964 through

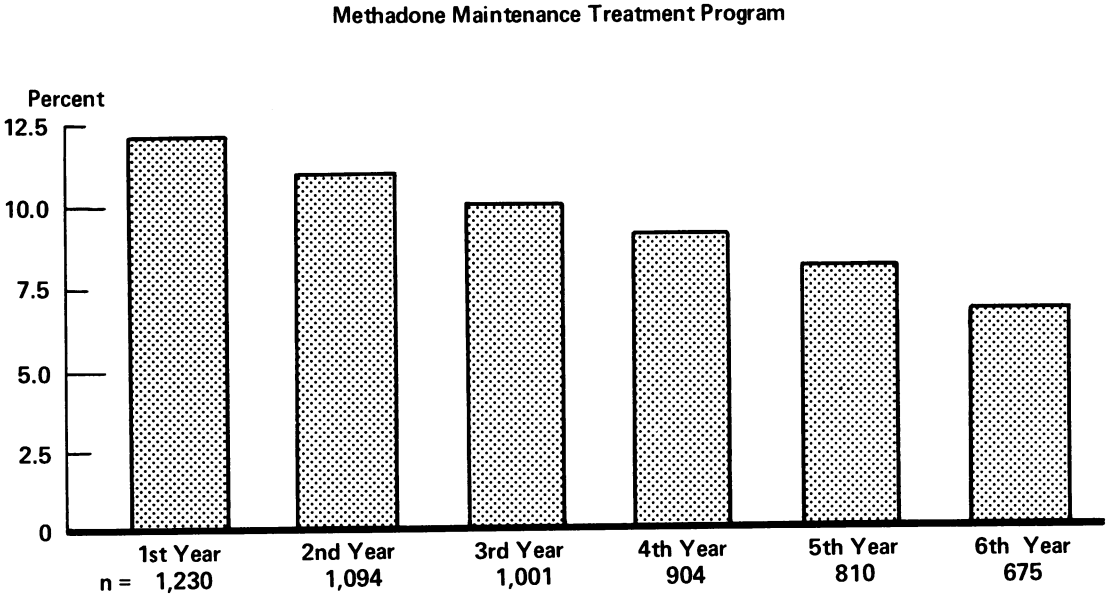

FIGURE 2—Discharge Rates from MMTP During the First Six Years After Entry. (n = number in MMTP at beginning of specified year).

December 31, 1973. This produced a crude indication of *change* in social productivity. As shown in Table 3, *unemployment* was cut by 36 percentage points with a concomitant increase in employment from 36 percent to 72 percent.

TABLE 3—Percentage of Change in Work Status of Entire MMTP Cohort

	At Start	December 1973	Change
	%	%	%
Employed	33	64	+ 31
In Training	2	3	+ 1
Homemaker	1	5	+ 4
Sub-Total	36	72	+ 36
Unemployed	64	28	—36
Total Percent	100	100	

n = 1,230

Table 4 illustrates the work status at the end of the study period for the 770 patients who had started in treatment a minimum of five years previously. In this group the percentage *remaining unemployed* has been reduced to 18 percent.

TABLE 4—Work Status of Participants in MMTP for Five Years of More (as of December 31, 1973)

	Number	Per Cent
Employed/In Training	593	77
Homemaker	38	5
Unemployed	139	18
Total	770	100%

When we classified the work status of these 770 patients, using a two-point scale as either socially productive (including employed, in training, or homemaker) or as unemployed, we note, in Table 5, that 92 percent of those classified as socially productive on admission remained in that category at the end of the study period, and 75 percent of those classified as unemployed on admission had become socially productive during the period of observation.

TABLE 5—Changes in Work Status Among Five-Year MMTP Participants (as of December 31, 1975)

		Socially Productive*	
	n	Number	Per Cent
Initial Work Status			
Unemployed	452	339	75
Socially Productive*	318	293	92
Total	770	632	82

*Includes Employed/In Training/Homemaker.

These changes in social productivity are further illustrated graphically in Figure 3 by sex, by age at time of admission, and by ethnic group. There was only slight variation between men and women, at each age, and among ethnic groups in either category.

Another way of looking at change in social productivity is to examine occupational classification for evidence of upward mobility. In order to accomplish this, we classified 664 patients on whom occupational histories were available on admission as well as at the end of the study period. We used a five-point occupational classification scale:

- Professional and Managerial
- Sales and Clerical
- Skilled
- Semi-skilled
- Unskilled

The results are shown in Table 6. The change which may be most important was in the *unskilled* category, where there was a *decrease* of 25 percentage points after five years in treatment. This change was reflected in the 15 percentage point increase in the skilled category and 5 in the semi-skilled area. There was an increase of 3 percentage points in the proportion of patients employed in the category of professional and managerial, these 20 men and women having completed their college requirements or graduate education while under treatment. The degrees they have earned include such diverse fields as aeronautical engineering and social work.

TABLE 6—Change in Occupational Classification After Five Years in MMTP

Occupational Classification	On Admission	After Five Years	Change
	%	%	%
Professional & Managerial	8	11	+ 3
Sales & Clerical	12	14	+ 2
Skilled	20	35	+15
Semi-Skilled	20	25	+ 5
Unskilled	40	15	—25
	100%	100%	

n= 664

It has been rumored that the majority of the employed methadone maintenance treatment patients work within the program. Although an effort is made by those who administer methadone maintenance treatment programs to employ at least one research assistant in each treatment unit, this accounts for less than 2 percent of the employed patients, and the majority of the research assistants were hired by the program after they had been successfully employed elsewhere.[6]

The type of job which a man on methadone maintenance is most likely to hold is one involving technical and motor skills—such as motor mechanic, TV or air conditioning repairman, truck or cab driver, tool and die worker, printer, computer or TV technician. Among the women, the majority are employed as waitresses, beauticians, switchboard operators, IBM operators, typists or secretaries, with a few practical nurses, technicians, models, and dancers.

Antisocial Behavior—Arrests and Drug Abuse

Despite the universal history of previous criminal activity as measured by reported arrests and incarcerations among the 770 patients who have continued in treatment, 654 (85 percent) have no record of arrests since admission. One hundred and sixteen persons had been arrested, some on more than one occasion. The total number of arrests in the cohort was 187 amounting to 1.24 arrests per 100 person years of observation. This is in sharp contrast to what might have been expected considering the previous picture of 201 arrests per 100 person years in the three years prior to admission.[5]

The over-all arrest rate for ten patients while in treatment during this period was 6.5 percent in the first year, 4 percent in the second year, 3 percent in the third year, 1.4 percent in the fourth year, and less than 1 percent in subsequent years. The population at risk of arrest during each year of observation is the number of patients in treatment at the start of each year as shown in Figure 2.

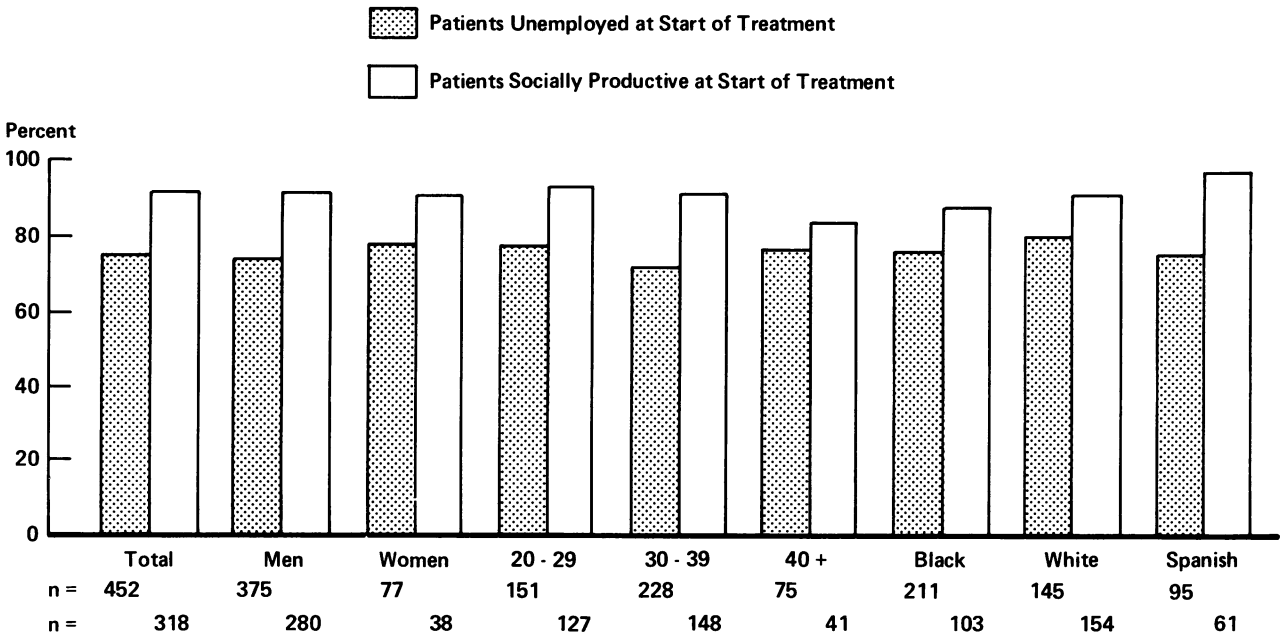

FIGURE 3—Social Productivity* After Five or More Years Participation (as of December 31, 1973)
***Included Employed, In Training, Homemaker.**

Patients in methadone maintenance have access to legal counsel *after* arrests. This has allowed the majority of the arrested patients to remain under treatment while awaiting trial rather than being incarcerated prior to conviction. Among the 187 arrests reported, 78 (41 percent) were among the patients who were in treatment as of December 31, 1973. Of these, 24 or 31 percent were in continuous treatment, and the remaining 54 (69 percent) have subsequently returned to treatment.

It has been suggested that the decrease in arrests is the result of the "bad patients" leaving the program, and the "good patients" remaining in treatment. It is worth repeating that the "criminal activity" we have measured is confined to approximately 15 percent of the patients.

Problems with overuse of alcohol, barbiturates, and amphetamines alone or in combination continue to be of concern in the management of approximately 25 percent of the methadone maintenance patients.

The chronic overuse of alcohol, either alone or in combination with the abuse of other drugs, continues to plague about 15 percent of the patients, and for about half of them has interfered with their ability to obtain or hold a job. The continued use of other drugs is a problem for another 10 percent.

Continued problems with drug abuse and alcohol, despite valiant efforts on the part of the treatment teams, has been responsible for the majority of the discharges except for the first few months when patients left the program voluntarily—after a very short "trial-run." Alcohol and drug abuse have also been involved in a substantial proportion of the deaths, both while in treatment and after leaving the program.[4]

Detoxification

Methadone maintenance on high dosage methadone (80-120 mg a day) has been referred to by critics of the concept of chemotherapy for heroin addiction as a life sentence to addiction by substituting methadone dependence for heroin dependence. Among the 770 patients in treatment as of December 31, 1973, there were 51 patients or 7 percent who had been methadone-free for periods varying from three months to over one year. An additional 53 patients (7 percent) were on low-dosage methadone maintenance (30 mg or less a day) in the process of slow detoxification.[6] Both of these groups continue under careful observation because among the 127 patients from this cohort who started toward a methadone-free status within the past year, 23 or 18 percent have been returned to high dosage methadone, either at the patient's request or on the advice of their physician.

Follow-Up of Patients Who Left Methadone Maintenance Treatment Program

An attempt was made to obtain follow-up information on the 393 patients from this cohort who had left the program alive and were not in treatment at the end of the study period (December 31, 1973).

Our primary source of follow-up was the New York City Narcotics Register which receives reports from the police and correction agencies, hospitals and social agencies, and from private practitioners. The results of this endeavor are summarized in Table 7. Forty-one percent were reported to have been arrested or imprisoned at least once, 27 percent had been hospitalized for detoxification one or more times, 15 percent were reported to be participating in an abstinence program, 6 percent were known to be dead, 3 percent were reported to be under treatment by private practitioners, and another 3 percent were known to have moved out of the metropolitan area. We were unable to obtain follow-up information on the remaining 5 percent. An interesting footnote is that 11 percent of the 393 discharged patients had returned to Methadone Maintenance Treatment one or more times for relatively short periods of time. These are considered the "revolving door" patients.

TABLE 7—Reported Follow-Up Status of 393 Patients Who Left MMTP and Were Not in Treatment as of December 31, 1973

	Number	Percent
Arrest/Jail	161	41
Detoxification Unit	106	27
Abstinence Program	59	15
Death	25	6
Private Physician	12	3
Left the Area	12	3
No Information	18	5
Total	393*	100%
*Returned to Treatment One or More Times	43	11%

Discussion

We recognized that the data we have presented are not the result of a classic "clinical trial." All patients had volunteered for treatment after at least two years of addiction to heroin. They selected methadone maintenance because they were either unwilling or unable to accept the philosophy of abstinence. This leads to a highly selected group. Further bias is introduced because they are a cohort of patients who have survived through their years of addiction without becoming a statistic in the medical examiner's office due to death from an overdose or from hepatitis, tetanus, bacterial endocarditis, or the plethora of other sequelae known to be associated with heroin addiction. In addition to these selection factors, the patients in this cohort had to be sufficiently motivated to be willing to wait for a period of from three to six months from the time of acceptance until time of admission for treatment.

We accept these selection factors because we believe that patients whose major problem is heroin addiction are very similar to patients with other chronic diseases—such as tuberculosis, diabetes, or stroke. In each of these diseases, no treatment regimen has had any measure of success, except with those patients who are motivated to become personally involved in their own rehabilitation.

These results from New York City cannot be compared with the results from Methadone Maintenance Treatment Programs in other cities because (a) the populations are not comparable, (b) the selection factors differ, and (c) the periods of observation are limited in most of the other programs to a maximum of two years.

Summary

In a cohort of 1,230 patients admitted to Methadone Maintenance Treatment between 1964 and 1968, 770 or 63 percent continued in treatment at the end of the study period, December 31, 1973. The total cohort had accumulated over 58,000 person-months in treatment. During this period, the percentage of patients who could be classified as socially productive rose from 36 percent to 72 percent, and there was a decline in unemployment from 64 percent to 28 percent. Among those in treatment at the end of the study period who were unemployed on admission, 75 percent were considered socially productive after five or more years of observation. Antisocial behavior as measured by arrests and incarcerations in the full cohort decreased from 201 per 100 person-years to 1.24, and approximately 85 percent of those who remained in treatment were completely arrest-free, despite their previous history of criminal activity. Among those who left the program during the study period, on whom follow-up information was available, evidence of return to heroin use was high, but 59 or 15 percent were reported to be in an abstinence program.

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